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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/830,858	Applicant(s) KONDO ET AL.	
	Examiner YOGESH K. AGGARWAL	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25,27-45,51-58 and 70-84* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25,27-45,51-58 and 70-84* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/10/2007*.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

Response to Arguments

1. Applicant's arguments filed 11/26/2007 have been fully considered but they are not persuasive.

Examiner's response:

2. Applicant argues with regards to claim 25 that Background art or applicant's admitted prior art fails to teach how the correction of distortion is carried out. The Examiner disagrees. Applicant's admitted prior art in Paragraph 8 teaches

"the information of the real world having the space and the time axis is acquired by a sensor and made into data. The data acquired by the sensor is the information obtained on projecting the information of the real world in the time and space of a lower dimension than the real world. So, the information obtained on projection is distorted due to projection. Stated differently, the data output by the sensor is distorted relative to the information of the real world. Moreover, the data, distorted by projection, also includes the significant information for correcting the distortion". Therefore the second signals generated by the sensor has information for correcting the distortion. Itokawa is used to teach signal processing means for extracting the significant information, buried by performing signal processing which is based on said second signals (containing significant information). Itokawa teaches boundary area specification as taught in col. 10 lines 45-59, figure 28 and the specifying the background and foreground areas (col. 10 lines 14-44, figure 28), said significant area (boundary area) containing the significant information buried by said projection is extracted (shape information being represented by a mixing ratio of the foreground and background as represented by equation 1, col. 10 line 60 is read as significant information).

3. Applicant argues with regards to claim 53 that the motion compensation of Astle is completely different than the claimed alleviated distortion, as claimed in claim 53. Specifically, the background and foreground changes does not teach or suggest generating a third signal with alleviated distortion caused by integrating effects of the sensor, as recited in claim 53. The Examiner disagrees. The motion blur or image blur caused in an image is due to the integrating effects of the sensor. When an object or the sensor moves there is an image blur known as motion blur appears that is caused due to this movement. For example as explained in US Patent 6,567,192 at col. 15 lines 30-36, when the image sensor 16 reciprocally moves securely in the main scanning direction, if the image is read while moving, the image is blurred due to integration effect. This is called motion blur. To avoid this kind of blur the shutter speed is made higher. Therefore in Astle a motion blur is caused by integrating effects of the sensor and is removed by separating background and foreground components similar to applicant's invention.

4. Applicant argues with regard to claim 70 that Astle or AAPA fail to teach "a separating unit configured to separate said mixed area in units of a pixel into said foreground object component and said background object component based on the specified results by said area specifying unit and said mixing ratio". The Examiner respectfully disagrees. Astle teaches at col. 9 line 48-col. 10 line 5 that In this case, as will be appreciated by those skilled in the art, to avoid an artifact along the boundary, pixel B.sub.1 is set equal to the previous <u>background pixel</u> at that location, while B.sub.2 is a blend of 75% background, 25% foreground <u>object pixel</u>. Therefore clearly a separating unit configured to separate said mixed area in units of a pixel into said foreground object component and said background object component. Astle further teaches a separation bitmap that may contain a plurality of bits per pixel location to indicate a

foreground/background mix to be used to construct the displayed bitmap (col. 9 lines 37-41). Astle teaches that a separation bitmap identifies which portion is foreground and which portion is foreground (col. 7 lines 37-39). Therefore a separation bitmap is based on area of the foreground and background pixels. Astle also teaches in col. 10 lines 8-20 specifying a foreground pixel F and a background pixel B based upon blending ratio R that is the amount of mixing between foreground and foreground. As stated in equation

F=P/R-(R-1)*B/R

And the value of the blended pixel is given by:

P=R*F+(R-1)*B

Therefore foreground and background pixel (F and B) have been determined based on the mixing ratio (R) and an area specifying means that specifies the backgound, foreground and mixed areas

5. Applicant argues with regards to claim 74 that Astle fails to teach a mixing ratio detecting unit configured to detect a mixing ratio between said foreground object components and said background object components at least in said mixed area based on the results specified by said area specifying unit and areas before and after said mixed area, as recited in claim 74. The Examiner respectfully disagrees. Astle teaches a separation bitmap that may contain a plurality of bits per pixel location to indicate a foreground/background mix to be used to construct the displayed bitmap (col. 9 lines 37-41). Astle teaches that a separation bitmap identifies which portion is foreground and which portion is foreground (col. 7 lines 37-39). Therefore a separation bitmap is based on area of the foreground and background pixels. Astle also teaches in col. 10 lines 8-20 specifying a foreground pixel F and a background pixel B based

upon blending ratio R that is the amount of mixing between foreground and foreground. As stated in equation

F=P/R-(R-1)*B/R

And the value of the blended pixel is given by:

P=R*F+(R-1)*B

Therefore foreground and background pixel (F and B) have been determined based on the mixing ratio (R) and an area specifying means that specifies the background, foreground and mixed areas and the value of the mixing ratio (R) between said foreground object components (F) and said background object (B) components at least in said mixed area is based on the results specified by said area specifying unit.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 25, 27-45, 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of Itokawa (US Patent # 6,404,901).

[Claim 25]

8. Applicant's admitted prior art teaches a signal processing apparatus comprising means for acquiring second signals of a second dimension by projecting first signals as real-world signals of a first dimension on a sensor and by detecting the mapped signals by said sensor, said

second dimension being lower than said first dimension, wherein said significant information is information for adjusting distortion produced by projection (Paragraph 8).

Applicant's admitted prior art fails to teach signal processing means for extracting the significant information, buried by performing signal processing which is based on said second signals and adjusting distortion produced by projection according to the significant information.

However Itokawa teaches boundary area specification as taught in col. 10 lines 45-59, figure 28 and the specifying the background and foreground areas (col. 10 lines 14-44, figure 28), said significant area (boundary area) containing the significant information buried by said projection is extracted (shape information being represented by a mixing ratio of the foreground and background as represented by equation 1, col. 10 line 60 is read as significant information).

Therefore taking the combined teachings of Applicant's admitted prior art and Itokawa, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have signal processing means for extracting the significant information by performing signal processing which is based on said second signals and adjusting distortion produced by projection according to the significant information in order to easily perform a natural image synthesization while accurately reducing the boundary portion thereby making the image quality better for the user.

[Claim 27]

Applicant's admitted prior art teaches a CCD wherein a CCD is inherently made up of a plurality of detection elements having time integrating effects (shutter time, Paragraphs 4-6), said acquisition means acquiring a plurality of detection signals for said respective detection

elements, as detected by said sensor, as said second signals, said distortion being the distortion caused by the time integrating effect (Paragraphs 7-10, It is noted that the motion blur increases or decreases with the increase in the time integration of a CCD. Therefore the distortion due to motion blur is caused due to the time integrating effects of a CCD).

[Claim 28]

Itokawa teaches wherein said acquisition means acquire said detection signals of a plurality of time units (figures 12a and 12b, col. 6 lines 61-65), as detected by plural detection elements of said sensor every predetermined time unit; said signal processing means extracting said significant information for said second signal of a desired time based on plural detection signals of said plural time units (col. 7 lines 23-33, figure 14a-14e teach calculating motion vectors based on signals acquired by plural detection elements of the image sensor at plural time units).

[Claim 29]

Applicant's admitted prior art teaches wherein said second signals are picture signals (e.g. Paragraphs 2-4 teach a CCD that generates picture signals).

[Claim 30]

Itokawa teaches wherein said signal processing means includes area specifying means for specifying a significant area (boundary area specification as taught in col. 10 lines 45-59, figure 28) and the other areas in said second signal (col. 10 lines 14-44, figure 28, specifying the background and foreground areas), said significant area (boundary area) containing the significant information buried by said projection (shape information being represented by a mixing ratio of the foreground and background as represented by equation 1, col. 10 line 60), outputting the area information specifying the specified area as said significant information (col.

10 lines 62-66, figure 29 shows mixed area pixels 702 and 703 and figure 31 shows the shape information comprising mixing ratio as taught in col. 11 lines 21-26).

[Claim 31]

See Examiner notes regarding rejection of claim 30.

[Claim 32]

Itokawa teaches wherein said area information contains the information for discriminating said mixed area into a covered background area and an uncovered background area (col. 6 lines 30-32).

[Claim 33]

Itokawa teaches wherein said signal processing means further includes significant information extracting means for extracting said significant information from an area containing said significant information specified by said area specifying means (shape information being represented by a mixing ratio of the foreground and background as represented by equation 1, col. 10 line 60 and figure 31 shows the shape information comprising mixing ratio as taught in col. 11 lines 21-2)

[Claim 34]

Itokawa teaches wherein said significant information specifies a mixing ratio of said foreground components and the background components in said mixed area of said second signal made up of a foreground area comprised only of foreground object components constituting the foreground objects, a background area comprised only of background object components constituting the background objects and a mixed area mixed from said foreground object components and said

background object components (See equation 1 comprising mixing ratio of foreground area as A, background area as B and boundary area as M, col. 10 line 60).

[Claim 35]

Itokawa teaches wherein said signal processing means further includes distortion adjustment means for adjusting the amount of distortion produced in said second signal by said projection based on said significant information (col. 1 lines 58-67 teach a motion blur being generated in the mixed area and col. 8 lines 30-49, figure 8 teach a motion compensation unit for adjusting the amount of motion blur).

[Claim 36]

Itokawa teaches motion compensation 108 (figure 8) that reduces the amount of said distortion.

[Claim 37]

Itokawa teaches motion compensation 108 (figure 8) that reduces the amount of said distortion (col. 5 lines 47-50) and therefore is considered to eliminate the amount of distortion. It is noted that the claim is broad and does not recite completely eliminating the amount of distortion.

[Claim 38]

Itokawa teaches wherein said distortion is movement blurring produced in said foreground object (col. 1 lines 58-67 states motion blur due to foreground objects and col. 6 lines 60-65 teach that the foreground object is moving and the background is not moved.).

[Claim 39]

Itokawa teaches wherein said signal processing means further includes object movement detection means for detecting the movement quantity of said foreground object (col. 7 lines 23-34, figures 14a-14e); and wherein said distortion adjustment means adjusts the quantity of

movement blurring which is said distortion based on said movement quantity of said foreground object (e.g. motion compensation block 108 adjusts the motion blur of the movement block).

[Claims 40-45]

See Examiner's notes regarding rejection of claims 34-39 respectively.

[Claims 51 and 52]

These are method and computer-readable claims corresponding to apparatus claim 25. Therefore they have been analyzed and rejected based upon apparatus claim 25.

9. Claims 53-58 and 70-84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of Astle (US Patent # 5,812,787).

[Claim 53]

Applicant's admitted prior art teaches a signal processing apparatus comprising signal acquisition means for acquiring a second signal by detecting a first signal as a real world signal of a first dimension by a sensor, said second signal being of a second dimension lower than said first dimension and containing distortion caused by integrating effects of said sensor with respect to said first signal (Paragraph 8, . The motion blur or image blur caused in an image is due to the integrating effects of the sensor. When an object or the sensor moves there is an image blur known as motion blur appears that is caused due to this movement. For example as explained in US Patent 6,567,192 at col. 15 lines 30-36, when the image sensor 16 reciprocally moves securely in the main scanning direction, if the image is read while moving, the image is blurred due to integration effect. This is called motion blur. To avoid this kind of blur the shutter speed is made higher. Therefore in Astle a motion blur is caused by integrating effects of the sensor and

is removed by separating background and foreground components similar to applicant's invention).

Applicant's admitted prior art fails to teach a signal processor configured to extract significant information buried by projection from said second signal by performing signal processing on said second signal and to generate a third signal alleviated in distortion as compared to said second signal according to the significant information.

However Astle teaches extracting significant information (blending ratio R) in col. 9 line 48-col. 10 line 36 and motion compensation on the foreground signals based on the blending ration R in the vicinity of foreground and background pixels corresponding to a desired bitmap 401 and based on bitmaps 301 and 401 acquired at different times. Astle teaches separating foreground and background components from the output of the sensor (col. 7 line 18 - col. 8 line 53, figures 1-4) and the foreground objects that move are motion compensated thereby generating a third signal that is alleviated in distortion as compared to said second signal (col. 9 lines 3-33, col. 10 lines 32-36).

Therefore taking the combined teachings of Applicant's admitted prior art and Astle, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have a signal processor configured to extract significant information buried by projection from said second signal by performing signal processing on said second signal and to generate a third signal alleviated in distortion as compared to said second signal according to the significant information in order to have a picture that is high in quality compared to the distorted signal thereby the photographs look better to the user.

[Claim 54]

Applicant's admitted prior art teaches wherein said sensor is made up of a plurality of detection elements having time integrating effects as said distortion (Paragraphs 4-6 describe a CCD that has plurality of pixels and uses electronic shuttering that is the same as integrating time of the CCD in order to remove the distortion), said acquisition means acquiring a plurality of detection signals detected by said sensor for said respective detection elements as said second signals (Paragraphs 4-6). Astle teaches separating foreground and background components from the output of the sensor (col. 7 line 18 - col. 8 line 53, figures 1-4) and the foreground objects that move are motion compensated thereby generating a third signal that is alleviated in distortion (col. 9 lines 3-33, col. 10 lines 32-36). It is noted that by compensating the motion blurred signal, the third signal is also alleviated in time integrating effects due to the time integration operation of the CCD because the motion blur increases or decreases with the increase in the time integration of a CCD. Therefore by compensating the motion blur as taught in Astle, the time integrating effects of a CCD are also alleviated.

[Claim 55]

Astle teaches wherein if a first object in the real world and a second object performing relative movement with respect to the first object are detected by said sensor (col. 7 line 18 - col. 8 line 53, figures 1-4), said signal processing means alleviates, by said signal processing, the distortion caused by the mixing of said first object and the second object due to time integrating effects of said sensor in the vicinity of a boundary between said first and second objects (col. 9 lines 17-col. 10 line 36). See the explanation in claim 54 regarding time integrating effects.

[Claim 56]

Astle teaches wherein said acquisition means acquire said detection signals of a plurality of time units, as detected by plural detection elements of said sensor every predetermined time unit (col. 8 line 21-col. 9 line 20, figures 3 and 4 teach how bitmaps 301 and 401 acquire two frames at different time units); said signal processing means alleviating, by said signal processing, the distortion caused in the vicinity of the boundary between said first and second objects represented by said second signal corresponding to a desired time unit based on said detection signal of plural time units (col. 9 line 48-col. 10 line 36 teach motion compensation on the foreground signals based on the blending ration R in the vicinity of foreground and background pixels corresponding to a desired bitmap 401 and based on bitmaps 301 and 401 acquired at different times).

[Claim 57]

Astle teaches wherein if a first object in the real world and a second object performing relative movement with respect to the first object are detected by said sensor, said signal processing means separates one of said first and second objects, from said first and second objects mixed in said second signal, to output the separated one of said first and second objects as said third signal (col. 7 line - col. 8 line 40, figure 3).

[Claim 58]

Astle teaches wherein said sensor converts light, as said first signal, into picture signals, as said second signal, by photoelectric conversion (col. 4 lines 50-65).

[Claim 70]

10. Astle teaches a signal processing apparatus (figures 1-5) for processing a predetermined number of detection signals acquired by a video camera (col. 4 lines 52-62). A video camera

inherently is made up of a predetermined number of detection elements having time integrating effects. Astle further teaches that the signal processing apparatus comprises area specifying means for specifying a foreground area made up only of foreground object components constituting an foreground object (col. 7 line 66-col. 8 line 3 teaches a separate foreground bitmap), a background area made up only of background object components constituting a background object (col. 7 lines 28-37, figure 3, background bitmap 302), and a mixed area mixed from said foreground object components and the background object components (col. 7 lines 37-39); mixing ratio detector detecting a mixing ratio of said foreground object components and said background object components at least in said mixed area (col. 9 line 48-col. 10 line 20); Astle teaches at col. 9 line 48-col. 10 line 5 that In this case, as will be appreciated by those skilled in the art, to avoid an artifact along the boundary, pixel B.sub.1 is set equal to the previous background pixel at that location, while B.sub.2 is a blend of 75% background, 25% foreground object pixel. Therefore clearly a separating unit configured to separate said mixed area in units of a pixel into said foreground object component and said background object component. Astle further teaches a separation bitmap that may contain a plurality of bits per pixel location to indicate a foreground/background mix to be used to construct the displayed bitmap (col. 9 lines 37-41). Astle teaches that a separation bitmap identifies which portion is foreground and which portion is foreground (col. 7 lines 37-39). Therefore a separation bitmap is based on area of the foreground and background pixels. Astle also teaches in col. 10 lines 8-20 specifying a foreground pixel F and a background pixel B based upon blending ratio R that is the amount of mixing between foreground and foreground. As stated in equation

F=P/R-(R-1)*B/R

And the value of the blended pixel is given by:

P=R*F+(R-1)*B

Therefore foreground and background pixel (F and B) have been determined based on the mixing ratio (R) and an area specifying means that specifies the backgound, foreground and mixed areas.

[Claim 71]

Astle teaches movement blurring quantity adjustment means for adjusting the movement blurring quantity of said foreground object (col. 9 lines 3-33, col. 10 lines 32-36).

[Claims 72, 73]

These are method and computer-readable claims corresponding to apparatus claim 70. Therefore they have been analyzed and rejected based upon apparatus claim 70.

[Claims 74-76]

See Examiner notes regarding rejection of claims 70 and 71.

[Claim 77]

Astle teaches detecting motion vectors only for foreground objects (col. 8 lines 4-5) movement blurring quantity adjustment means for adjusting the movement blurring quantity of said foreground object based on the detected movement (col. 9 lines 3-33, col. 10 lines 32-36).

[Claims 78, 79]

These are method and computer-readable claims corresponding to apparatus claim 74. Therefore they have been analyzed and rejected based upon apparatus claim 74.

[Claims 80-82]

See Examiner notes regarding rejection of claims 70, 71 and 77 respectively.

[Claims 83, 84]

These are method and computer-readable claims corresponding to apparatus claim 80. Therefore they have been analyzed and rejected based upon apparatus claim 80.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOGESH K. AGGARWAL whose telephone number is (571)272-7360. The examiner can normally be reached on M-F 9:00AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Lin Ye can be reached on (571)-272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

YKA
March 15 2008

/Lin Ye/

Supervisory Patent Examiner, Art Unit 2622